

[Health Care Services Agency]

## INFANT/PERINATAL MORTALITY UPDATE

INSTITUTE OF GOVERNMENTAL  
STUDIES LIBRARYAlameda County  
1984

NOV 7 1986

UNIVERSITY OF CALIFORNIA

Summary

Black infant mortality continued to be a major concern in 1984, as the rate of infant deaths among Blacks was over twice the non-Black rate in Alameda County. Similarly, the proportion of Black low birthweight births continued to be over twice the low birthweight proportion of any other ethnic group in the County. Alameda County infant mortality decreased over the period 1978-1984, while postneonatal mortality increased, although neither change was statistically significant. Perinatal mortality, however, decreased at a statistically significant rate over the same time period. High Risk health planning areas (HPAs) continued to have rates of infant mortality and low birthweight births substantially higher than the remainder of the County.

1984 Infant/Perinatal Mortality and Low Birthweight Births

The infant mortality rate for Alameda County residents in 1984 was 9.7 deaths per 1000 live births, compared with 10.2 in 1983. The 1984 perinatal mortality rate was 11.2 deaths per 1000 total births, compared to 11.9 in 1983. The above decreases in rates reflect an increase in the number of live births without a corresponding increase in infant or fetal deaths.

The percentage low birthweight births for the County was 7.1%, compared to 6.8% in 1983.

Long-Term Trends in Mortality, 1978-1984, Alameda County, and Comparison with State and Federal Rates

## A. Infant Mortality

Analysis of the County observed rates of infant mortality for the years 1978-1984 indicates a modest decline in mortality, although not at as high a rate of decrease experienced by the State and the U.S. during the same time period. Table 1 shows the observed rates of infant mortality for Alameda County, the State of California, and the U.S. for the seven-year period. The Federal and State rates show a fairly steady decline; the County rates are much more erratic due to the random error that is present in estimating rates that are based on a comparatively small number of births and deaths. The observed rates for the County indicate a decrease of 0.26 deaths per 1000 live births per year.<sup>1</sup> Infant deaths for the County, however, declined at only half the U.S. rate, and at only 60% of the State rate during the same time period.

---

<sup>1</sup> See Appendix A for further explanation and analysis.





TABLE 1

## OBSERVED RATES OF INFANT MORTALITY

Alameda County, the State of California, and the U.S.  
1978-1984

	INFANT MORTALITY RATES <sup>1</sup>							CHANGE IN RATE <sup>2</sup>
	1978	1979	1980	1981	1982	1983	1984	
ALAMEDA COUNTY	12.0	9.6	11.0	10.8	9.3	10.2	9.7	-0.26
CALIFORNIA	11.9	11.3	11.1	10.2	9.8	9.7	9.4	-0.43
U.S.	13.8	13.1	12.5	11.7	11.2	10.9	10.7 <sup>a</sup>	-0.54

<sup>1</sup> Infant Mortality Rate =  $\frac{\text{Neonatal Deaths} + \text{Postneonatal Deaths}}{\text{Live Births}} \times 1000$

<sup>2</sup> Number of deaths per 1000 live births per year.

<sup>a</sup> Provisional Data.

Source: Alameda County Health Care Services Agency, Management Systems and Analysis, Vital Records, 1978-1984; State Department of the Health Services, Health Data and Statistics Branch; U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics.

### B. Perinatal and Postneonatal Mortality

Examination of the observed perinatal and postneonatal mortality rates for the County during the same time period showed a significant decrease in perinatal mortality but a slight increase in postneonatal mortality. Perinatal mortality decreased at a statistically significant rate of 0.70 deaths per 1000 total births, while postneonatal mortality increased at a rate of 0.08 deaths per 1000 live births.<sup>2</sup>

Table 2 shows the observed rates of postneonatal mortality for Alameda County, the State of California, and the U.S. for 1978-1984. Although the increase in the rate for the County was not statistically significant, it is disconcerting that the observed rates showed an increase while both California and U.S. rates showed a decrease for the same time period.

<sup>2</sup> See Appendix B for further explanation and analysis.



Digitized by the Internet Archive  
in 2024

<https://archive.org/details/C124890288>



TABLE 2

## OBSERVED RATES OF POSTNEONATAL MORTALITY

Alameda County, the State of California, and the U.S.  
1978-1984

	POSTNEONATAL MORTALITY RATES <sup>1</sup>							CHANGE IN RATE <sup>2</sup>
	1978	1979	1980	1981	1982	1983	1984	
ALAMEDA COUNTY	4.6	3.4	3.7	4.3	3.5	4.6	4.6	+0.08
CALIFORNIA	4.2	3.9	3.9	3.7	3.6	3.5	3.5	-0.11
U.S.	4.3	4.2	4.1	3.9	3.6	3.7	3.7	-0.12

<sup>1</sup>Postneonatal mortality rate =  $\frac{\text{Postneonatal Deaths}}{\text{Live Births}} \times 1000$

<sup>2</sup>Number of deaths per 1000 live births per year.

Source: Alameda County Health Care Services Agency, Management Systems and Analysis, Vital Records, 1978-1984; State Department of the Health Services, Health Data and Statistics Branch; U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics.

### High Risk HPAs Designation

[The data calculated in 1984 for HPA mortality rates did not alter the list of designated High Risk HPAs for perinatal/infant mortality from 1983. These HPAs are West Berkeley (HPA 2), Emeryville/North Oakland (HPA 5), North Broadway (HPA 6), West Oakland (HPA 8), Highland Area (HPA 10), East Oakland (HPA 13), East Oakland II (HPA 14), East Oakland III (HPA 15), Fairmont (Ashland) Area (HPA 22), and South Central/South Hayward (HPA 26).]

### Difference in Mortality Rates among County Subgroups

Differences in mortality between High Risk HPAs and the remainder of the County and between Blacks and Non-Blacks continued to be substantial in 1984. Table 3 shows infant, perinatal, postneonatal, and total mortality rates by County subgroup for 1978-1984. High Risk HPAs continued to have an infant mortality rate that was over 1.5 times the rest of the County. Additionally, the rate that the observed infant mortality decreased in these high risk areas was almost ten times slower than the County remainder.





TABLE 3  
 INFANT, PERINATAL, POSTNEONATAL, AND TOTAL MORTALITY RATES BY COUNTY SUBGROUP  
 Alameda County Residents  
 1978-1984

	INFANT MORTALITY RATES							CHANGE
	1978	1979	1980	1981	1982	1983	1984	IN RATE <sup>1</sup>
COUNTY TOTAL	12.0	9.6	11.0	10.8	9.3	10.2	9.7	-0.26
High Risk HPAs	14.7	12.9	13.9	14.0	14.3	14.0	13.5	-0.04
County Remainder	10.8	8.0	9.7	9.3	6.9	8.4	7.9	-0.39
Black	16.9	13.4	16.1	14.7	13.4	16.9	17.5	+0.22
Non-Black	10.3	8.5	9.4	9.5	8.0	8.2	7.4	-0.38

	PERINATAL MORTALITY RATES <sup>2</sup>							
	1978	1979	1980	1981	1982	1983	1984	
COUNTY TOTAL	15.4	14.8	15.8	13.6	14.5	11.9	11.2	-0.70
High Risk HPAs	21.0	17.4	20.8	16.0	21.2	14.2	12.8	-1.10
County Remainder	12.7	13.5	13.6	12.4	11.2	10.8	10.5	-0.43
Black	25.3	19.5	23.2	16.9	20.6	18.6	15.1	-1.30
Non-Black	11.9	13.4	13.4	12.5	12.6	9.9	10.1	-0.47

	POSTNEONATAL MORTALITY RATES							
	1978	1979	1980	1981	1982	1983	1984	
COUNTY TOTAL	4.6	3.4	3.7	4.3	3.5	4.6	4.6	+0.08
High Risk HPAs	6.0	4.9	4.9	6.2	5.6	5.6	7.3	+0.21
County Remainder	3.9	2.8	3.1	3.4	2.4	4.1	3.4	+0.01
Black	6.2	5.3	6.0	7.0	6.5	6.2	9.5	+0.44
Non-Black	4.0	2.9	3.0	3.4	2.5	4.1	3.2	-0.02

	TOTAL MORTALITY RATES <sup>3</sup>							
	1978	1979	1980	1981	1982	1983	1984	
COUNTY TOTAL	20.0	18.2	19.4	17.8	17.9	16.4	15.9	-0.62
High Risk HPAs	27.0	22.2	25.7	22.2	26.8	19.9	20.1	-0.87
County Remainder	16.6	16.3	16.5	15.8	13.7	14.8	13.9	-0.50
Black	31.4	24.8	29.1	23.9	27.0	24.7	24.5	-0.82
Non-Black	15.9	16.2	16.3	15.9	15.1	13.9	13.3	-0.49

1 Change In rate per 1000 live births (and fetal deaths) per year.

2 Perinatal Mortality Rate =  $\frac{\text{Fetal} + \text{Neonatal Deaths}}{\text{Live Births} + \text{Fetal Deaths}} \times 1000$

3 Total Mortality Rate =  $\frac{\text{Fetal} + \text{Neonatal} + \text{Postneonatal Deaths}}{\text{Live Births} + \text{Fetal Deaths}} \times 1000$

Source: Alameda County Health Care Services Agency, Management Systems & Analysis, Vital Records, 1978-1984.





Blacks experienced an infant mortality rate almost 2.5 times greater than non-Blacks in 1984. Of greater concern, this gap is part of a widening trend between the two subgroups that has been apparent since 1981. Although Blacks showed an increase in infant mortality over the seven-year period, this was primarily due to an increase in infant mortality in the last two years only. It is important to watch these rates in the future to see if an actual trend develops. In the meantime, it is more probable that the true rate of infant mortality among Blacks has held steady at disturbingly high levels.

Analysis of the perinatal and postneonatal mortality rates by County subgroup shows that the largest reductions in perinatal mortality over the seven-year period have been achieved in Blacks and High Risk HPAs. It appears that the gap between High Risk HPAs and the County remainder has started to decline, although not as dramatically for Blacks and non-Blacks.

While perinatal mortality showed a decrease among Blacks and in High Risk HPAs, the true postneonatal mortality rates do not appear to have changed in these two groups. While the observed rates have fluctuated, it is only in 1984 that the rates have shown a large increase. It is prudent to watch these rates closely also, to see if a trend develops in the future. Postneonatal mortality has continued to be at least 1.5 to 2 times higher among Blacks than non-Blacks in the County.

Examination of the observed proportions of total mortality (fetal, neonatal and postneonatal deaths) shows that although Blacks and the High Risk HPAs have continued to have higher rates than non-Blacks and the County remainder, respectively, the total mortality among these groups is decreasing at a faster rate. This is due to the more rapid decline of the perinatal death rate in these groups.

#### Low Birthweight Births - 1984 Update

The percentage low birthweight births in the County continued to hold steady at about 7%, while the proportion of Black births that are low birthweight continued to be more than twice the low birthweight proportion of any other ethnic group in the County. Table 4 shows the low birthweight proportions by County subgroups. The proportion of low birthweight births in High Risk HPAs has been at least 1.5 times higher than in the remainder of the County since 1978.

#### RECOMMENDATIONS

High infant mortality among Blacks continues to be the highest priority item that should be targeted for intervention with County services. Since progress is being made on reducing perinatal mortality, new focus should be placed on reducing postneonatal deaths. However, since many of the risk factors for postneonatal mortality are similar for perinatal mortality, continued emphasis on comprehensive prenatal care programs, especially for young black mothers, is recommended to reduce the Black infant mortality rate. More direction on serving the needs of the Black mother during the first year of the infant's life is also needed to accomplish this objective. An extensive outreach and media



campaign similar to the efforts made as part of the Oakland Perinatal Health Project in 1979 could be highly effective were it to emphasize not only the need for early prenatal care but also the need for continuing pediatric care.

An evaluation to insure that the Community Health clinics and field nurses are reaching the population that is in greatest need of prenatal services should be undertaken. A preliminary examination of prenatal care visits by clinic and field nursing services show that four of the High Risk HPAs are missing from the top 10 HPAs that receive the most prenatal care visits.<sup>3</sup> With the most efficient use of County services and with innovative programs that can inform those in need of how to obtain those services, a large impact can be made to reduce Black infant mortality, and infant mortality County-wide, in the future.

TABLE 4  
PERCENT LOW BIRTHWEIGHT LIVE BIRTHS  
BY RACE/ETHNICITY AND HIGH RISK HPAs/COUNTY REMAINDER

Alameda County Residents  
1978 - 1984

	1978	1979	1980	1981	1982	1983	1984
COUNTY TOTAL	7.3	7.5	7.1	7.2	7.1	6.8	7.1
White	5.4	6.0	5.7	5.7	4.9	5.1	5.3
Hispanic	5.2	4.4	5.0	4.2	5.9	5.2	5.1
Black	12.8	12.2	11.3	11.7	12.3	12.1	12.9
Other	5.7	6.4	6.1	6.1	6.3	5.5	5.8
High Risk HPAs	9.9	10.2	9.3	9.8	10.0	9.2	9.3
County Remainder	6.1	6.3	6.1	6.0	5.7	5.6	5.9

SOURCE: Alameda County Health Care Services Agency, Management Systems and Analysis, Vital Records 1978-1984.

<sup>3</sup> A more detailed report of these findings is in progress.





## APPENDIX A

### EPIDEMIOLOGICAL ANALYSIS OF INFANT MORTALITY, ALAMEDA COUNTY, 1978-1984

Although California and U.S. data have shown fairly stable declines in infant mortality from 1978 to 1984, Alameda County rates have fluctuated to a much larger degree, due to random variability when using small numbers of births and deaths. To further understand the instability of the County data, the observed infant mortality rates are plotted on Figure 1, along with their 95% confidence intervals, from 1978 to 1984. The observed infant mortality rate is only an estimate of the true infant mortality rate, which we would like to know as precisely as possible. The confidence interval is a range of values which is determined by the amount of random error in the data. The wider the confidence interval, the more imprecise the estimate will be. In Figure 1 where the observed infant mortality rates are plotted, the true infant mortality rates are thought to be within the boundaries of the confidence limits. For example, in 1978, we are 95% confident that the true infant mortality rate lies somewhere between 9.7 and 14.3 deaths per 1000 live births. Our best estimate of the true rate is 12.0, or the observed rate for that year. As can be seen from Figure 1, the limits of the confidence intervals range from a high of 13.3 deaths in 1980 to a low of 7.5 deaths per 1000 births in 1982.

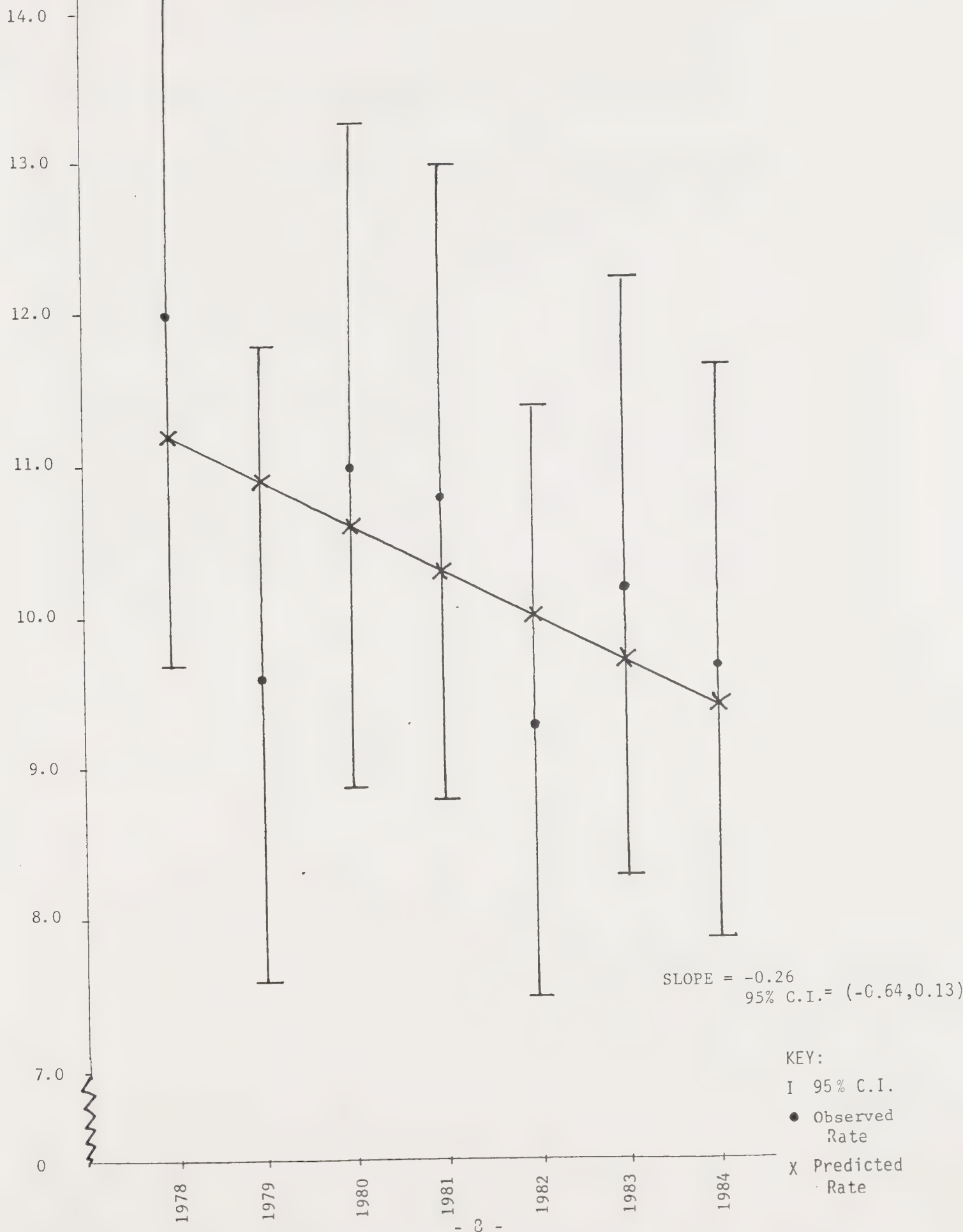
Figure 1 also shows the regression line through the data and the predicted rates based on linear regression. This line is the "best fit" of the data assuming the data follows a linear relationship. The "slope" of the line (change in the rate divided by the change in years) can be determined. For this time period, infant mortality is calculated to be decreasing at a rate of 0.26 deaths per 1000 live births per year. This decline in rate was not found to be statistically significant. This means that the probability that random variation alone explains the decrease is substantial.

If infant mortality continues to decrease at this linear rate, we would expect an infant mortality rate in Alameda County of 9.4 in 1985 and 8.1 by 1990.





FIGURE 1: OBSERVED INFANT MORTALITY RATES (IMR)  
AND 95% CONFIDENCE INTERVALS,  
ALAMEDA COUNTY, 1978 - 1984





## APPENDIX B

### EPIDEMIOLOGICAL ANALYSIS OF PERINATAL AND POSTNEONATAL MORTALITY, ALAMEDA COUNTY, 1978-1984

Observed perinatal and postneonatal mortality rates and their corresponding 95% confidence intervals are given in Figures 2 and 3 for the years 1978-1984. Calculation of the slope of the regression line for perinatal mortality shows a decrease of 0.70 deaths per 1000 total deaths per year. The results of a standard t-test shows that this decrease is statistically significant with a p-value of less than 0.01. This means that there is less than a 1% chance that this observed decline is due to random error. Calculation of the confidence limits for the slope show that we are 95% sure that the true rate of decrease lies somewhere between 0.26 and 1.14 deaths per 1000 total births.

Calculation of the slope for the regression line for postneonatal deaths for the same time period shows an observed rate of increase of 0.08 deaths per 1000 births per year. The t-test for significance of the slope yields a p-value of 0.50, which means there is a 50% chance that the observed increase is due to random error alone. It is hard to make any definitive statements about such a slight observed increase, but there is a chance that a problem with increased postneonatal mortality exists, but our data is insufficient for a finding of statistical significance. Calculation of the confidence limits indicates that we are 95% confident that the true rate lies between a decrease of 0.19 and an increase of 0.34 deaths per 1000 live births per year. Postneonatal mortality should be watched closely in the future to see if the observed rate continues to increase.





FIGURE 2: OBSERVED PERINATAL MORTALITY RATES (PMR)  
AND 95% CONFIDENCE INTERVALS,  
ALAMEDA COUNTY, 1978 - 1984

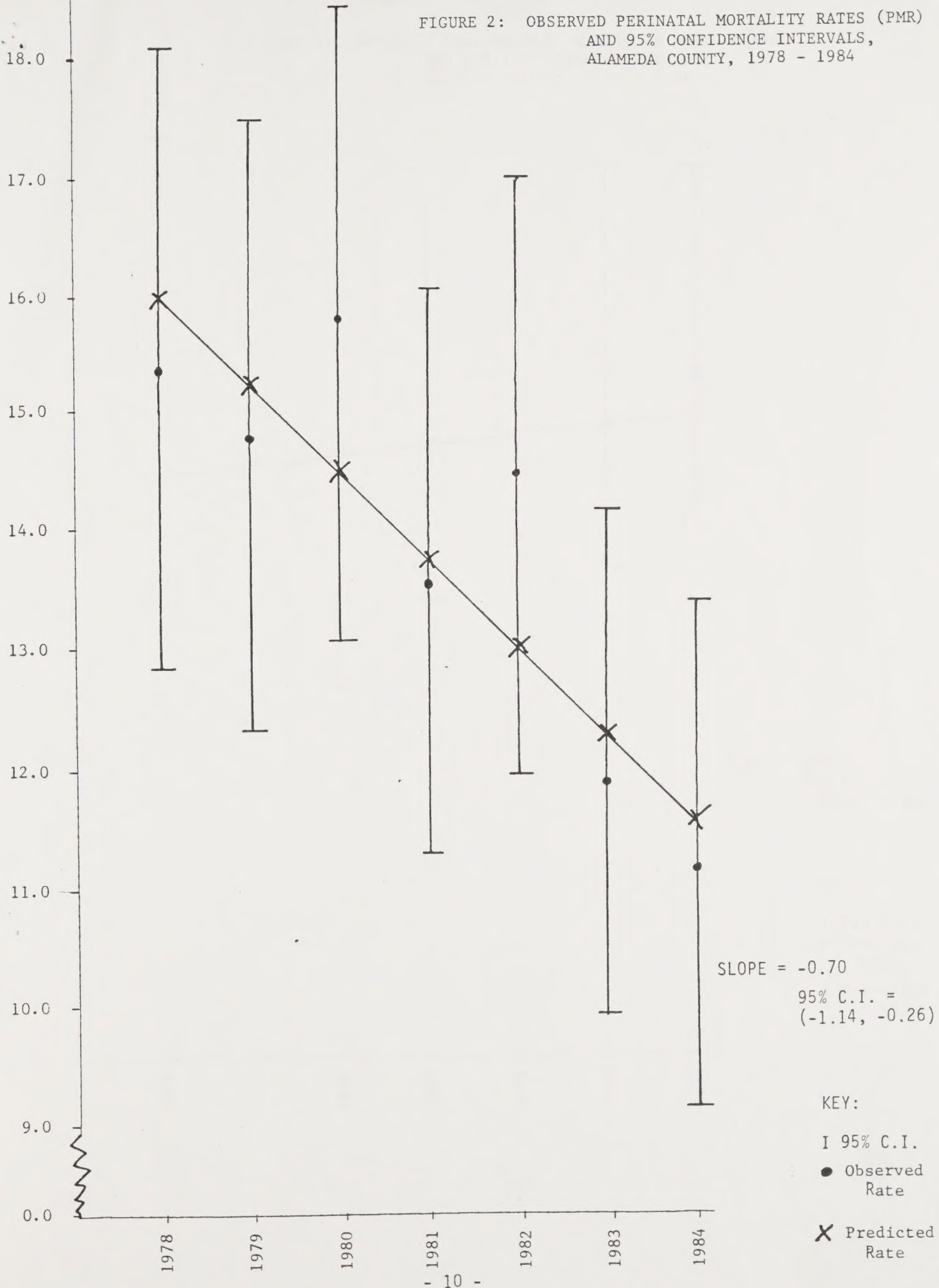
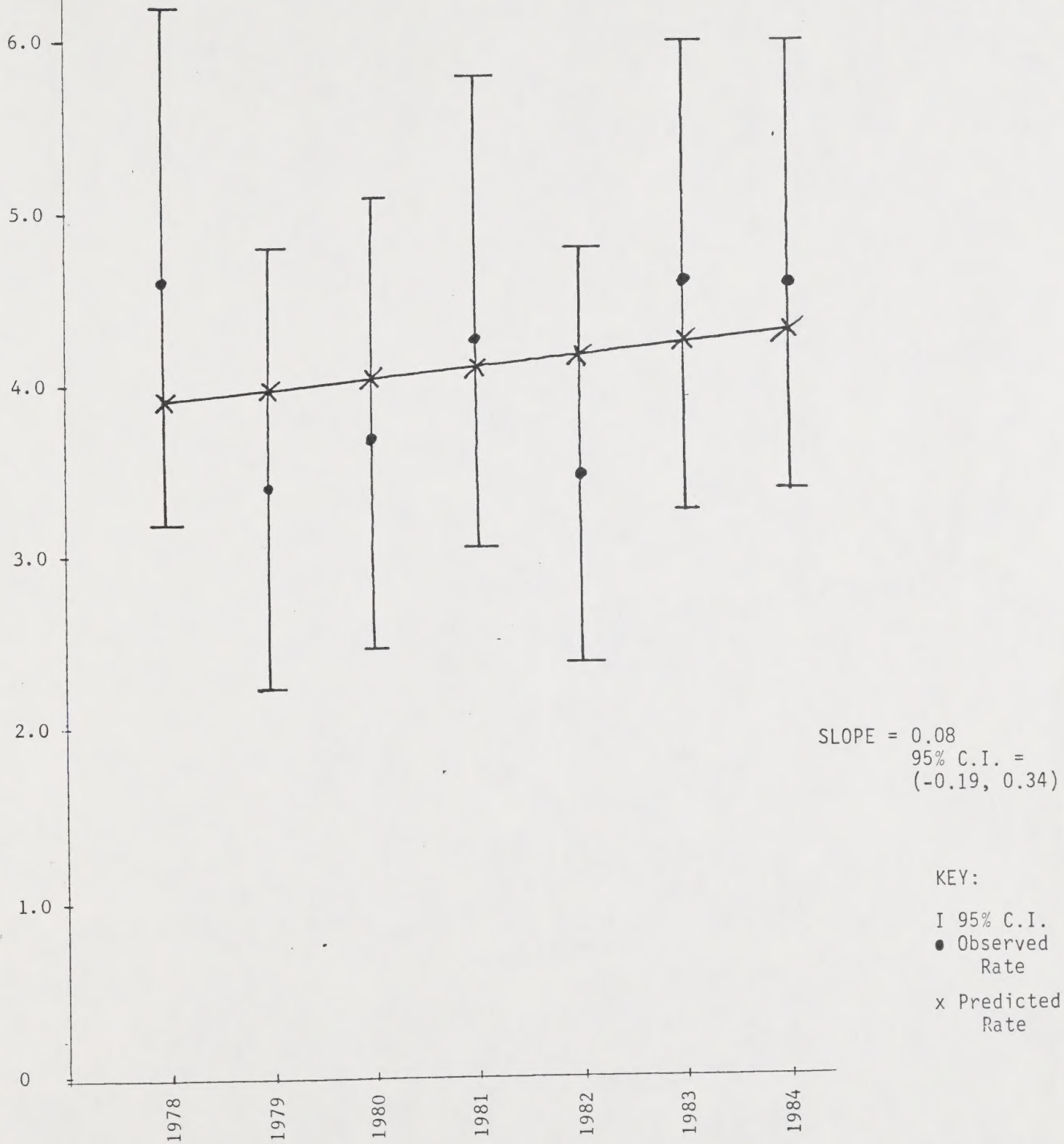






FIGURE 3: OBSERVED POSTNEONATAL MORTALITY RATES (PNMR)  
AND 95% CONFIDENCE INTERVALS,  
ALAMEDA COUNTY, 1978 - 1984



U.C. BERKELEY LIBRARIES



C124890288